

REMARKS/ARGUMENTS

The present amendment is in response to the final Official Action mailed on July 28, 2005. Applicants have amended independent claims 1, 8, and 15 to change the phrase "depth direction" to "depth value." This change is to make the terminology more consistent with the remaining language of the claims which compares "values." Applicants have also changed "from" to "of" to clarify the nature of the produced blurred image. Such amendments are for clarification purposes and are not intended to narrow the scope of the claims. Claims 1-21, as amended, remain pending.

As an initial matter, applicants' counsel would like to thank Examiner Jankus for the courtesies extended by him during a telephone interview on November 2, 2005. During the interview, applicants' attorney explained the operation of the claimed invention and the differences between the claimed invention and the cited primary prior art of *Potmesil*. With this submission, applicants respond to the Examiner's contentions as to *Potmesil* and the other cited prior art references. Applicants maintain that good cause exists for entry of this amendment since it addresses the Examiner's contentions as to the prior art and includes clarifying amendments that follow from the interview.

In the Official Action, claims 1-5, 8-12, and 15-19 were rejected under 35 U.S.C. § 102(b) as being anticipated by *Potmesil et al.* ("*Potmesil*"). Claims 16, 13, and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Potmesil* in further view of *Max et al.* ("*Max*"). Finally, claims 7, 14, and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Potmesil* in further view of *Foley et al.* ("*Foley*").

It is respectfully submitted that none of the independent claims are anticipated by *Potmesil*. In particular, as explained

in further detail below, *Potmesil* lacks a blurring unit or step that first produces a blurred image of the image in the just-in-focus state. Consequentially, *Potmesil* lacks an overwriting unit or step that selectively overwrites portions of that blurred image on the image in the just-in-focus state by comparing a preset Z value to the Z value of each of the dots in the Z buffer.

An example of the above-mentioned limitations of the pending claims can be seen by reference to FIGS. 7, 9, and 10 of the present application. In FIG. 7, there is presented an image in a just-in-focus state. In FIG. 9, the blurring unit or blurring step produces the blurred image (blurred image of FIG. 9) of the image in the just-in-focus state. This can be done, for example, by a pixel reduction and expansion process. Next, as shown in FIG. 10, an overwriting unit or step selectively overwrites portions of the blurred image (FIG. 9) by comparing a preset Z value to the Z value of each of the dots in the Z buffer. The results of the blurring and overwriting steps are the composite image of FIG. 10.

This claimed process of blurring the just-in-focus image to produce a blurred image and overwriting portions of the blurred image on the image in the just-in-focus state — by comparing a preset Z value to the Z value of each of the dots in the Z buffer — is not found in *Potmesil*. *Potmesil*, rather, uses a different blurring process that does not involve (1) producing a blurred image of the just-in-focus image (e.g., FIG. 9) or then (2) selectively overwriting portions of that blurred image on the image in the just-in-focus state by comparing a preset Z value to the Z value of each of the dots in the Z buffer. Rather, as explained on page 86 of *Potmesil*, the image generation process consists of two stages. In the first stage, a hidden-surface processor generates point samples of intensity in the image using a pinhole camera model. In the second stage,

a postprocessor converts the sampled points into an actual raster image. Each sampled point is converted into a "circle of confusion" with a size and intensity distribution determined by the depth of the visible surface and the characteristics of the lens and aperture model. The intensity of a pixel is computed by accumulating the intensity distributions of overlapping circles of confusion for all sample points.

As discussed at pages 100-106 of *Potmesil*, the synthetic image is thus generated based on the F-stop and depth of field setting of the virtual camera. Table values (pages 99-100) are used to generate the pixel values based on the camera settings and the particular ranges of depth as shown, for example, in Table 1.

Turning to the Official Action, in paragraph 3, the Examiner contends that *Potmesil* includes, *inter alia*, a blurring unit and an overwriting unit as called for in claim 1. This is not the case, however, since *Potmesil* does not first produce a blurred image of the focused image. Rather, the focus processor of *Potmesil* generates an image, which is focused and has a depth of field, from the image samples generated from the hidden-surface processor and from the given lens and aperture parameters (page 97). The lens and aperture setting's contribution, the impulse-response h , is the point-spread function (PSF - which describes the form and degree of degradation in the imaging system), whose shape depends on the depth of the input sample.

The focus processor performs two steps. First, tables of PSFs are computed at intervals along the z' axis between the nearest and farthest points in the image, as shown in Figure 10, for given lens and aperture parameters (page 99). Second, the processor processes each input point sample by distributing its intensity to output pixels according to the values stored in the table nearest to the sample's z' depth value. This two-step

process requires computation of tables of point-spread functions and processing of each input point sample. The presently claimed invention, by contrast, simply blurs the just-in-focus image, and the overwrites portions of that blurred image on the image in the just-in-focus state based on a preset Z value.

Because of the different process used by *Potmesil*, *Potmesil* also lacks an overwriting unit or step that selectively overwrites portions of the blurred image (produced as described above) on the just-in-focus image.

As to the dependent claims, the limitations of claim 2 are not disclosed or suggested in *Potmesil* given that there is no disclosure of changing the preset Z value arbitrarily and continuously with time. Rather, FIGS. 12-14 only show different virtual camera settings used to produce different pictures and not an arbitrary and continuously changed preset Z value over a period of time such that the image field of the objects that are in the just-in-focus state is correspondingly changed.

As to dependent claims 3-5, *Potmesil* does not disclose or suggest a blurring unit that produces reduced images and then magnifies the reduced images to generate the out-of-focus images. This is not taught or disclosed as Section 3.1, which discloses only the generation of point samples of light intensity within the field of view of the camera model and converting the samples into a raster image or passing them to a second processor which converts them into a raster image that is focused and has a depth of field. There is no discussion of taking an image in the just-in-focus state, and blurring that image by reducing and magnifying the image to generate the out-of-focus image. (See, for example, FIG. 8 and FIG. 9 of the present invention.)

As to dependent claim 6, *Potmesil* operates much differently than the presently claimed invention, and does not perform a masking process to overwrite all unmasked objects with

corresponding ones of the out-of-focus images. This is because *Potmesil* does not perform an overwriting process as called for in the claimed invention which selectively overwrites portions of the blurred image of the image in the just-in-focus state, on the image in the just-in-focus state by comparing a preset Z value to the Z value of each of the dots in the Z buffer. Thus, while a concept of masking generally may be disclosed in *Max et al.*, the type of masking disclosed in *Max et al.* is unlike the masking process of the present invention. Rather, *Max* discloses blurring an opaque mask representing an area covered by an object and using that mask to hide further objects or backgrounds when each new blurred object is added into the scene. Thus, the use of a mask to hide further objects or backgrounds when new blurred objects are added is unlike the selective masking of the overwriting unit or step to selectively mask objects corresponding to the preset Z value and to overwrite all unmasked objects to with the corresponding ones of the out-of-focus images such that objects located further and nearer than the present Z value are out-of-focus. (See, e.g., FIG. 12 of the present application.)

As to claim 7, the Examiner notes that *Potmesil* does not explicitly teach the use of a VRAM, and thus cites *Foley*, which merely discloses the structure of a VRAM chip. Even if one were to incorporate the VRAM chip disclosed in *Foley* into *Potmesil*, the invention of dependent claim 7 would not be produced, since *Potmesil* does not disclose, teach, or suggest the blurring unit producing sequentially produced images (let alone in the VRAM) and magnifying the reduced images to generate a plurality of different levels of out-of-focus images.

Finally, applicants address the Examiner's response to applicants' previous arguments set forth in paragraph 8 of the Official Action. First, the Examiner contends that applicants asserted that *Potmesil* lacked certain features but that such

features were not found in claim 1. As to *Potmesil*'s failure to teach a "composite image," claim limitation (d) of claim 1 provides an overwriting unit that overwrites portions of the blurred image on the image in the just-in-focus state. This process thereby produces a composite image (i.e., portions of a blurred image overwritten on a just-in-focus image). As to blurred images being made from parts of an image in a just-in-focus state, applicants agree that the "made from parts" language is not found in claim 1. However, applicants still maintain that *Potmesil* fails to teach or disclose a blurring unit that, as a first step, produces "a blurred image of the image in the just-in-focus state."

As to applicants' argument that *Potmesil* fails to disclose or teach an overwriting operation by consideration depth direction of the objects, this feature is found in claim limitation (d), in which the overwriting unit selectively overwrites portions of the blurred image on the image in the just-in-focus state by comparing a preset Z value to the Z value of each of the dots in the Z buffer. The Z buffer establishes the depth direction (value) of objects in an image.

On page 6 of the Official Action, the Examiner states that *Potmesil* teaches, *inter alia*, "a blurred image generated by the focus processor." *Potmesil*, however, does not produce a blurred image of the image in the just-in-focus state as noted above. As such, *Potmesil* does not overwrite portions of such produced blurred image on the image in the just-in-focus state.

Accordingly, for all of the reasons set forth above, applicants maintain that the presently pending claims are neither anticipated nor rendered obvious by *Potmesil* or the other prior art references cited by the Examiner. Accordingly, favorable reconsideration of this application is respectfully solicited.

In view of the above, each of the presently pending claims

in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

If, however, for any reason the Examiner does not believe that such action can be taken at this time, it is respectfully requested that he telephone applicants' attorney at (908) 654-5000 in order to overcome any additional objections which he might have.

If there are any additional charges in connection with this requested amendment, the Examiner is authorized to charge Deposit Account No. 12-1095 therefor.

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Respectfully submitted,

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